

# **Multi media Studio Guide**

**Version: 3.9**

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**<http://www.MIDI-Kit.nl>**



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**Ton Valkenburgh**

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## **Introduction**

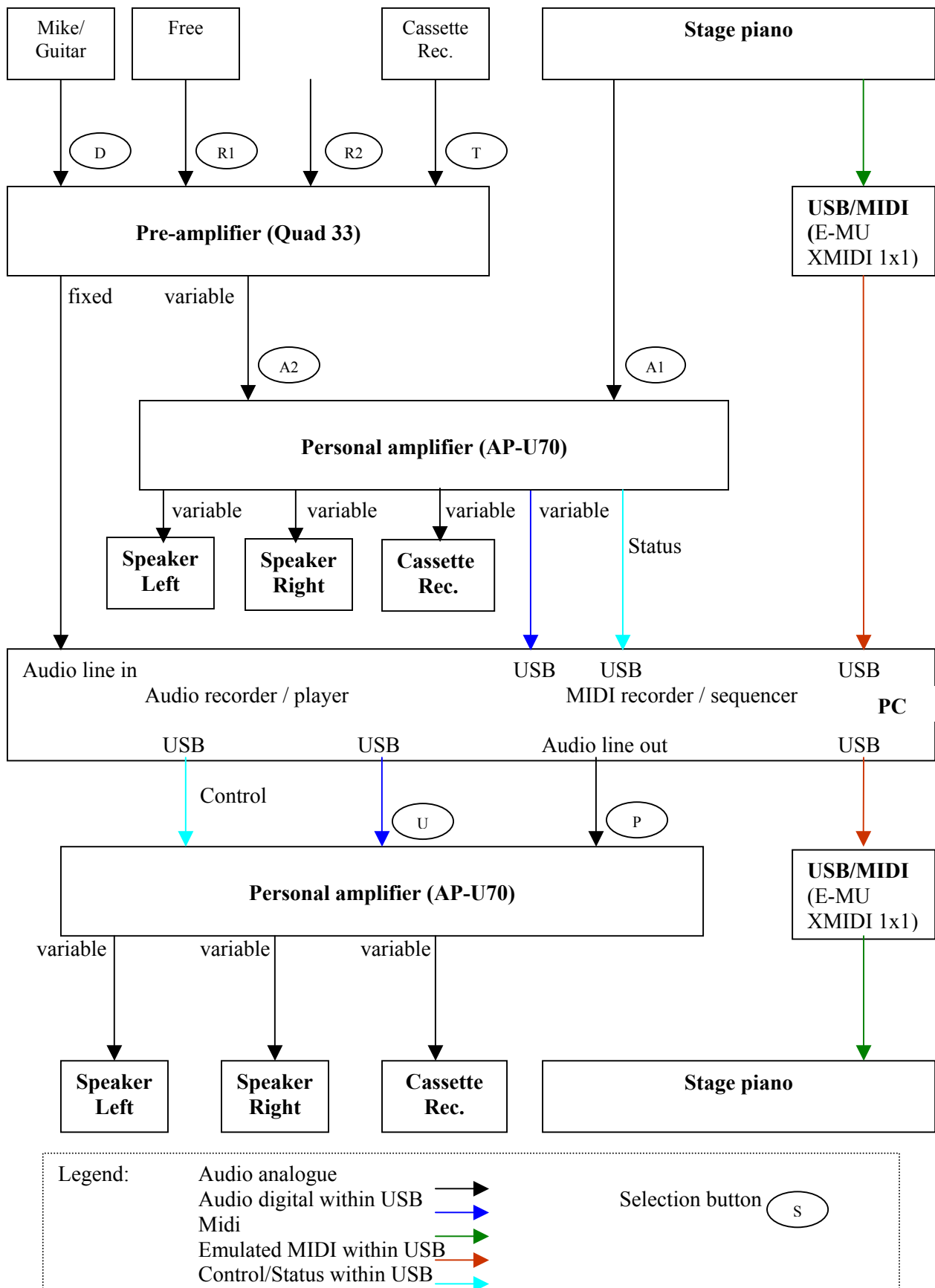
The guide describes the components used in the multi media studio: the equipment and the used software. The interconnection between the different software is given with the recommended mode of operation.

First, a logical view is given of the information/data flows.

Then a general overview of the equipment is given, with the used software. Finally a short description is given of how the different programs are used and how information between them can be transferred.



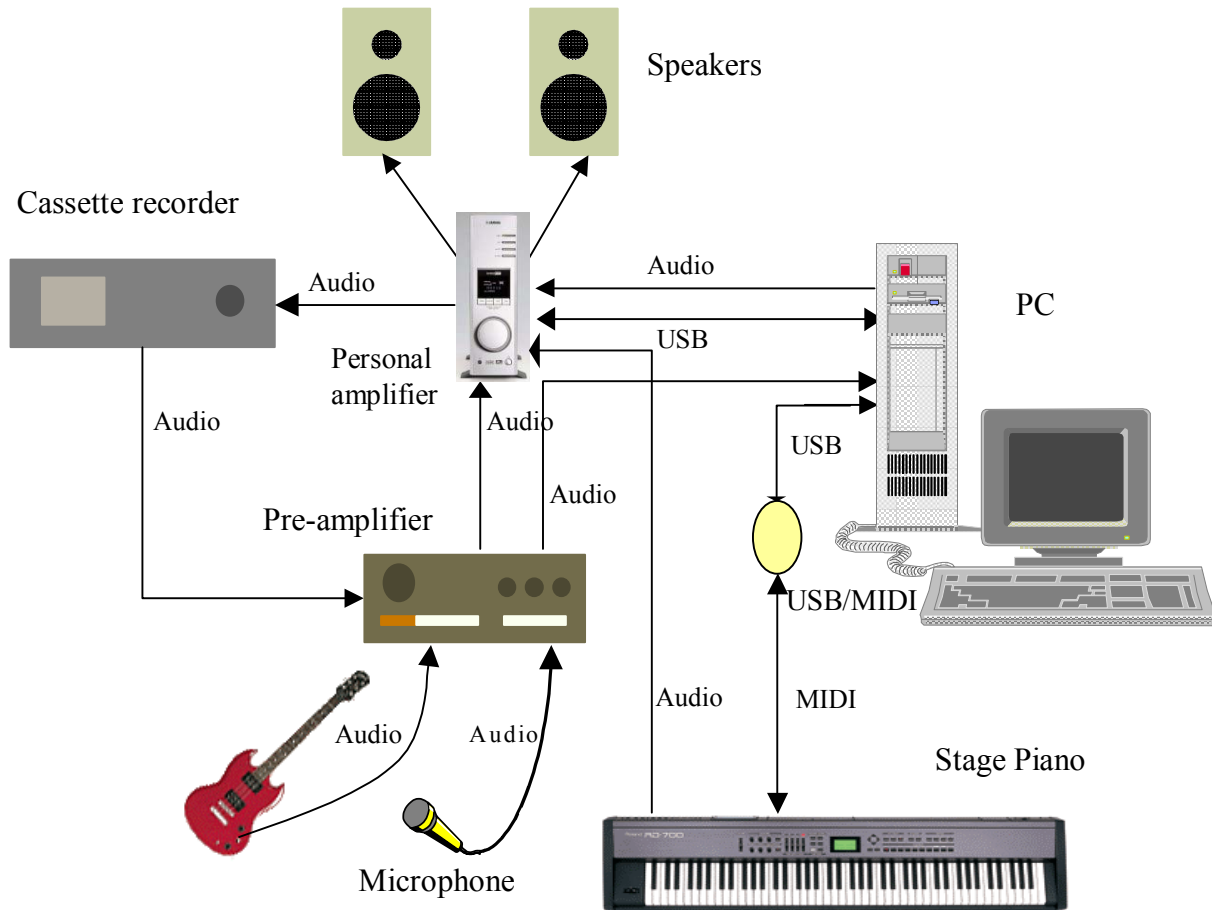
## Logical view





## Equipment

### Interconnection



### Hardware

Equipment	Type	Manufacturer	Purpose
PC	AP Pro 7	Advanced Power	Storage and manipulation of the recordings, production of CD's
Personal amplifier	AP-U70	YAMAHA	AD / DA conversion, recording input / output, main amplifier
Pre-amplifier	QUAD 33	Quad	Pre-amplifier
Microphone	F-VX30	Sony	Microphone
Cassette recorder	AD-F300	AIWA	Cassette recorder
USB/MIDI	XMIDI 1x1 Tab	E-MU	USB-MIDI conversion
Stage piano	RD-700	Roland	Digital piano and sound module



<b>Equipment</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Purpose</b>
Guitar	Mod 106	Raimundo	Acoustic guitar
Guitar	Epiphone SG	Epiphone	Electric guitar
Speakers	Philips	RH 544	Monitoring
Headphone	HD 590 Prestige	Sennheiser	Headphone



## Software

Software	Manufacturer	Purpose
Windows 7 x64 Home Premium	Microsoft	Operating system
Cakewalk Sonar 8.5 Producer Edition	Twelve Tone systems	MIDI-sequencer and audio recording / editing
MuseScore	Open source	Music score editing
Cool Edit Pro version 2.00 <sup>1</sup>	Syntrillium	Audio recording and editing; MP3 generation; conversion to 16-bit for CD production
Nero 7 Premium	Nero	CD/DVD production
Photoshop Elements 5	Adobe	Photo enhancements
PTLens	EpaperPress	Lens distortion and perspective correction
Vegas Movie Studio Platinum 9	Sony	Video creation
DVD Architect 4.5	Sony	Creation of DVD's
Yrec-24	YAMAHA	24-bits recording with low CPU usage

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<sup>1</sup> Cool Edit Pro does not run in Windows 7. I use it within Sun VirtualBox with Windows XP.





## Software-interfaces / data formats

### Introduction

The base for audio is by default the PCM format<sup>2</sup>. Recordings are made with a definition of 24 bits and a sample frequency of 44.1 kHz, mostly in stereo. This is the high quality base for later manipulation of the audio data. We use on disc the PCM 32-bits 44,1 kHz format to keep high quality audio.

### ASIO for All

This generic ASIO driver can be used to reduce the audio latency. Sonar 6 and the Yamaha AP-U70 personal amplifier do not perform (many drop-outs) with the ASIO for All driver.

### Cakewalk Sonar 8.5

Sonar will be used for MIDI editing and sequencing. Scores from Cubasis Notation will be imported in the 'MIDI 1' format.

### Cool Edit Pro

Recordings in 24-bit made by Yrec.exe can be read in with 'Cool Edit Pro' with the following options: Windows PCM, 32-bit (float) / 24-bit packet Intel PCM with offset +2.

We use PCM 32-bits (16.8 float) 44,1 kHz format for temporarily storage during the manipulations of the audio data. This ensures the quality of audio we need for final mastering.

The master files for CD production are in 16-bit PCM 44,1 kHz format. We generate the files with the following 'Cool Edit Pro' options: dithering 1 bit, Gaussian, Noise shaping C1.

### Cubasis Notation

Cubasis Notation will be used for music score editing. For editing/sequencing the MIDI information scores will be exported in 'MIDI 1' format to be imported in Cakewalk. Not all information will be stored within the 'MIDI 1' format.

### Nero 7 Premium

With Nero CD's and AVCHD DVD's are created.

### Photoshop Elements

I use Photoshop for processing raw format, and for enhancement of the photos.

### PTLens

I use PTLens for correction of lens distortion and perspective.

### Vegas Movie Studio Platinum 9

I switched from Pinnacle to Vegas Movie Studio, because the product is more stable, faster, and generates a better picture quality than Pinnacle.

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<sup>2</sup> See also Multiple Channel Audio Data and Wave Files:  
<http://www.microsoft.com/hwdev/tech/audio/multichaudP.asp>



With Vegas Movie Studio AVCHD data streams are created. Due to a bug<sup>3</sup> in Vegas Studio, it is not possible to create AVCHD DVD's. Therefore, I have defined a bypass procedure. See [“AVCHD DVD's”](#).

Sometimes, AVCHD rendering runs into a deadlock when using multi-threading. The by-pass is to define in “Preferences>Video” the “Maximum number of rendering threads” at one. Unfortunately, this will result in a longer rendering time. Therefore, you should only do this if you run into a deadlock with more threads.

## **DVD Architect**

DVD Architect is a back-end of Vegas Movie Studio. It is used to define the contents of a Video DVD.

## **YAMAHA recorder**

The YAMAHA application Yrec.exe with the YAMAHA AP-U70 can be used for stereo recordings in PCM 16-bit en 24-bit with sample frequencies of 44,1 kHz or 48 kHz. The AP-U70 with the recording application is the center of the studio; therefore, we use these formats for transfer of data between the different audio applications.

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<sup>3</sup> According to Sony the DVD's Vegas Movie Studio creates is not an AVCHD disc, but a BD DVD9. It will play on Play Station 3 and on Sony Blu-Ray players. However, most Blu-Ray players like e.g. from Panasonic will not support these discs. It is coupling Sony products with other Sony products. My recommendation is to stay away from Sony products. They are trying to lock you in.



## Configuration aspects

During configuration, SONAR 6<sup>4</sup> does not support audio devices with different bit-depth, even if only one device driver is selected. This means that for support of 24-bit you must disable – during the configuration - in the Windows hardware profile all 16-bit audio devices. After finishing the complete audio configuration you can again enable your 16-bit audio devices. However, I recommend keeping them disabled.

After the first start-up of SONAR after configuration you must ignore the 16-bit drivers.

Another approach with less stress during configuration and more predictable results is using the ASIO driver of your 24-bit device<sup>5</sup>. If your device does not have an ASIO driver, you can use 'ASIO4ALL'. For the configuration see "[Cakewalk Sonar 6 \(with ASIO4ALL driver\)](#)"

## Cakewalk Sonar 6 with MME (32-bit)<sup>6</sup>

1. Preferable: do not yet install SONAR. However, if you have already installed SONAR 6, delete the AUD.INI file located in: '\Program files\Cakewalk\SONAR 6 Producer Edition';
2. Click with the right mouse button on 'My Computer' and select Properties;
3. Click with the left mouse button on the 'hardware' tab;
4. Choose 'Device Manager';
5. Click with the left mouse button on 'Sound, video and game controllers';
6. Click with the right mouse button on the 16-bit audio device;
7. Select 'Disable';
8. Repeat 'Disable' for all 16-bit devices;
9. Install SONAR and configure audio as stated below;
10. If SONAR forces the device to 16-bit, you have to change the AUD.INI file (step 11 through 16), otherwise you can go to step 17;
11. Exit SONAR;
12. Go to '\Program files\Cakewalk\SONAR 6 Producer Edition' and 'double click' on AUDI.INI;
13. Change in the statement 'Use24BitExtensible=0' for your 24-bit audio device the '0' into '1';
14. Remove – if in AUD.INI - all information for your 16-bit audio devices;
15. Save AUDI.INI;
16. Start SONAR, and enable your 24-bit;
17. Exit SONAR;
18. Now enable your 16-bit devices again;
19. Start SONAR, and do not use the 16-bit devices.

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<sup>4</sup> Later versions as if Sonar 8.5 let you deselect the 16 bits drivers, and than work with only the 24-bits audio interface.

<sup>5</sup> The disadvantage of this is, that you cannot share the audio device between two programs unless both use the ASIO driver.

<sup>6</sup> For SONAR 6 the MME (32-bit) driver will give better performance than the DWM/KS driver. You will get earlier drop-outs when using the WDM/KS driver.



## ***Global options***

### **General**

- Deselect: 'On Stop, Rewind to Now Marker'.

### **Folders**

- Project files: E:\udata\cwp30;
- CAL files: E:\udata\cwp30\CAL.

### **Audio data**

- Global Audio folder: D:\Geluid;
- Picture Folder: D:\Mijn Video's;
- File Bit Depth: 24 bit
- Deselect: Use per-project Audio folder.

## ***Audio device configuration for Yamaha AP-U70***

### **General**

- Playback timing master: USB-audioapparaat<sup>7</sup>;
- Record timing master: USB-audio-apparaat;
- Audio Driver Bit Depth: 24<sup>8</sup>;
- Sampling Rate: 44.100 Hz;
- Select: 64-bit Double precision Engine;
- Buffers in play back queue: 4;
- Buffer Size at such value that the effective latency is 30 msec.

Use the Wave profiler - after making all (below) settings - to determine the DMA buffer sizes.

### **Advanced**

- Deselect: Enable Read Caching;
- Deselect: Enable Write Caching;
- I/O buffer size: 128 kB;
- Driver Mode: MME (32-bit);
- Dithering: Triangle;
- Select: 'Play effect tails after stopping';

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<sup>7</sup> Note that SONAR 6 does not recognize the correct device name of the Yamaha AP-U70 when using the WDM driver.

<sup>8</sup> To enable 24-bit mode for the AP-U70 the variable 'Use24BitExtensible' in SONAR's AUD.INI file must be set to 1. The variable can be found in the USB-Audioapparaat section of AUD.INI.



- Select: 'Share Drivers With Other Programs'.

### **Drivers**

- Select: User friendly names to represent audio drivers;
- Enter user-friendly driver names (Yamaha AP-U70).
- Select: the YAMAHA AP-U70 USB Audio driver.

### **Driver Profiles**

Stream > 16 bit data as: 4 bytes left justified.

## **Cool Edit Pro for YAMAHA AP-U70**

### ***Device Properties***

#### **Wave Out**

- Select: YAMAHA AP-U70 USB Audio;
- Select: 'Use This Device In Edit View';
- Select 'Send 32-bit audio as': 3 Byte Packet PCM;
- Deselect 'Try As WDM'.

#### **Wave In**

- Select: YAMAHA AP-U70 USB Audio;
- Select: 'Use This Device In Edit View';
- Select 'Get 32-bit audio as': 3 Byte Packet PCM;
- Deselect 'Try As WDM'.

## **E-MUXMIDI 1x1 Tab**

### ***Installation***

Use for this device the Vista Drivers from the website of E-MU. The Driver installation program must run in Vista (Service Pack 2) compatibility mode.

## **YAMAHA AP-U70**

### ***Set-up***

#### **USB Multi-Channel Setting**

- Select: 2 channels.



### **Volume setting**

- Enable 'USB Mix On', and set at –12 dB;
- Set 'Digital Volume Setting' on maximum with an analog input activated.<sup>9</sup>

**NOTE:** The Yamaha AP-U70 application and Sweex wireless media presenter IA001 interfere with each other. The application cannot be started, It will give an error message during initialization, and abort . Therefore, the AP-U70 application cannot be used together with the IA001. However, the AP-U70 and IA001 can be used together.

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<sup>9</sup> This setting is automatically adjusted if the actual sound level exceeds 0 dB. Therefore, it has to be checked every time when a recording from analog input will be made.



## AVCHD DVD's

AVCHD (Advanced Video Codec High Definition) is a format defined by Panasonic and Sony. It is used by HD video cameras. It is possible to create HD DVD's with this AVCHD format. Of course, there is less room on the disk than on a Blu-Ray disk. Videos around twenty or thirty minutes are achievable.

Vegas Movie Studio Platinum 9 supports the burning of AVCHD DVD's. However, due to a bug in Vegas Movie Studio the DVD's will not play on Blu-Ray players.

With Nero Vision of Nero 7<sup>10</sup>, you can also create AVCHD DVD's. Unfortunately, your input data stream will in most cases again rendered with a loss of quality. The smart render option of Nero Vision will not prevent this in most cases. The maximum data stream in Nero is 14.000 kbits/s. Vegas Studio, however, supports higher data streams. The lower speed of Nero will result in lower quality, which you want to avoid.

There is, however, a solution if you do not use menus in your video. In four steps, you can create the AVCHD DVD without rendering it again in Nero Vision.

1. Create an AVCHD template;
2. Create an AVCHD data stream out of your project;
3. Update the template with the AVCHD data stream;
4. Burn an UDF 2.5 DVD-rom from the template.

Next time, you can skip step one, because the created AVCHD template can also be used for your following AVCHD DVD's, which do not contain menus.

## AVCHD template

We will use Nero Vision for the template creation.

Start **Nero Vision** (in the Nero folder of your **Start Menu**. Look inside the **Photo and Video** subfolder and open Nero Vision) and the window of Nero Vision will be shown. Select Create DVD, than AVCHD. You must now compile your video. Keep it simple and use short video file as input. After Nero Vision has done its analyze, click 'More'. Select 'Video options', and set the wanted options. Click 'Ok'.

Select 'Do not make a menu', Than 'Next'. You can now see your video. Click again 'Next'. Now you are ready for burning. Select 'Burn'.

The created DVD provides us with all we need for the template. Make a folder on your hard disc e.g.: 'ADCHD template'. Copy the contents of the DVD to this folder. You have now created the template for burning AVCHD DVD's.

## AVCHD data stream

In Vegas Movie Studio, you now create your project. When you are done, you create an AVCHD data stream by selecting 'File>Render As'. In the pop-up menu, you can select the kind of video stream, which you want to create. Select the 'Sony AVC' option with the wanted resolution. The rendering process will create an 'm2ts' file.

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<sup>10</sup> You must get the latest update of Nero 7 for this feature.



## Update AVCHD template

You must now replace the '00000.m2ts' file in your AVCHD template with the 'm2ts' file of your project. In the template you will find the '00000.m2ts' file in the folder: BDMV\STREAM. The new filename must be again: '00000.m2ts'.

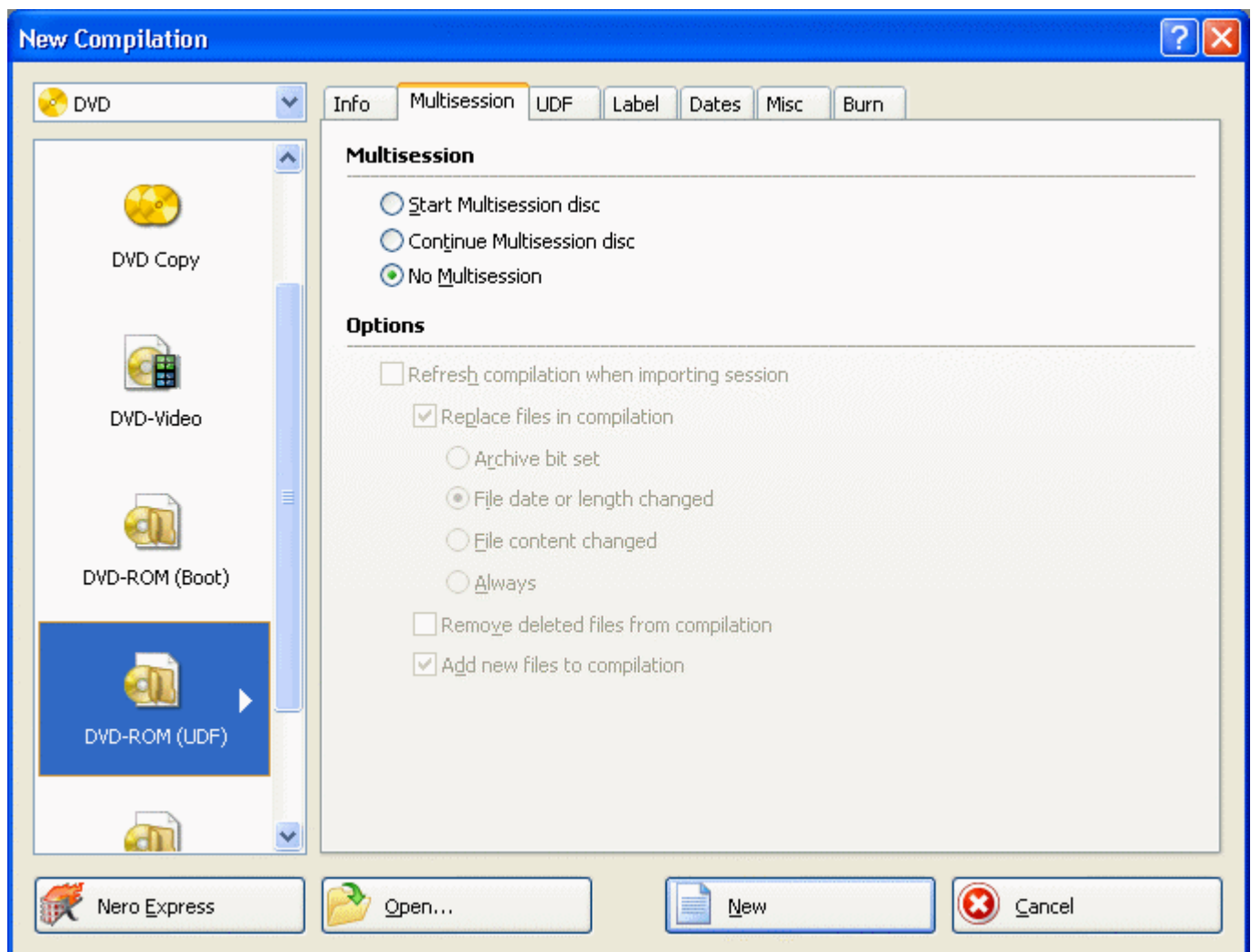
You have now the content for your AVCHD DVD.

## Create DVD-ROM (UDF)

(I copied the procedure from: [www.afterdawn.com](http://www.afterdawn.com)), but modified the text according to the AVCHD template.

You will burn an AVCHD DVD with Nero Burning Rom.

Start **Nero Burning ROM** (not Nero Express) in the Nero folder of your **Start Menu**. Look inside the **Data** subfolder and open Nero Burning ROM) and you will immediately see the **New Compilation** window.



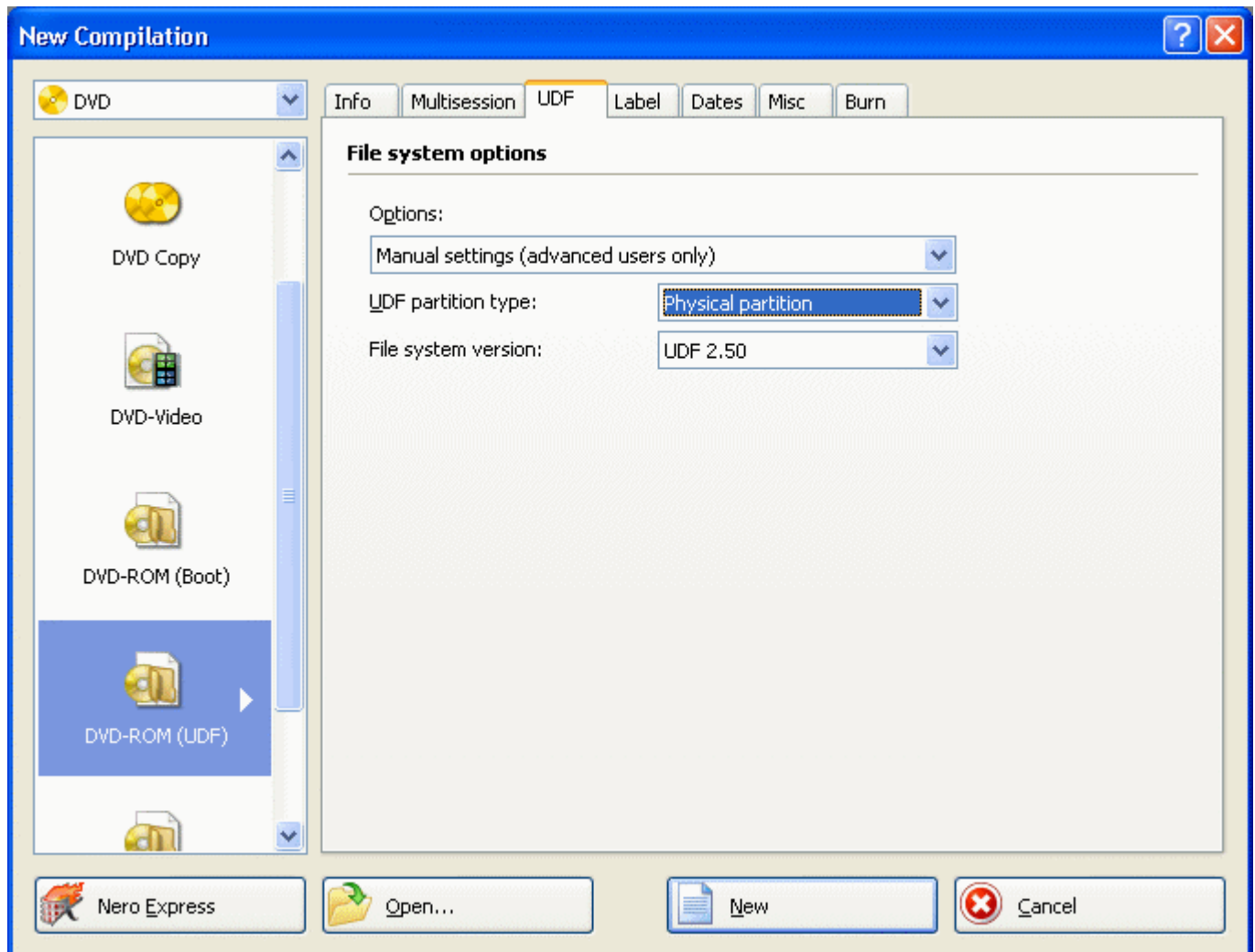
If you do not see this window, then click **File --> New** or hit **CTRL + N**. You will now see your





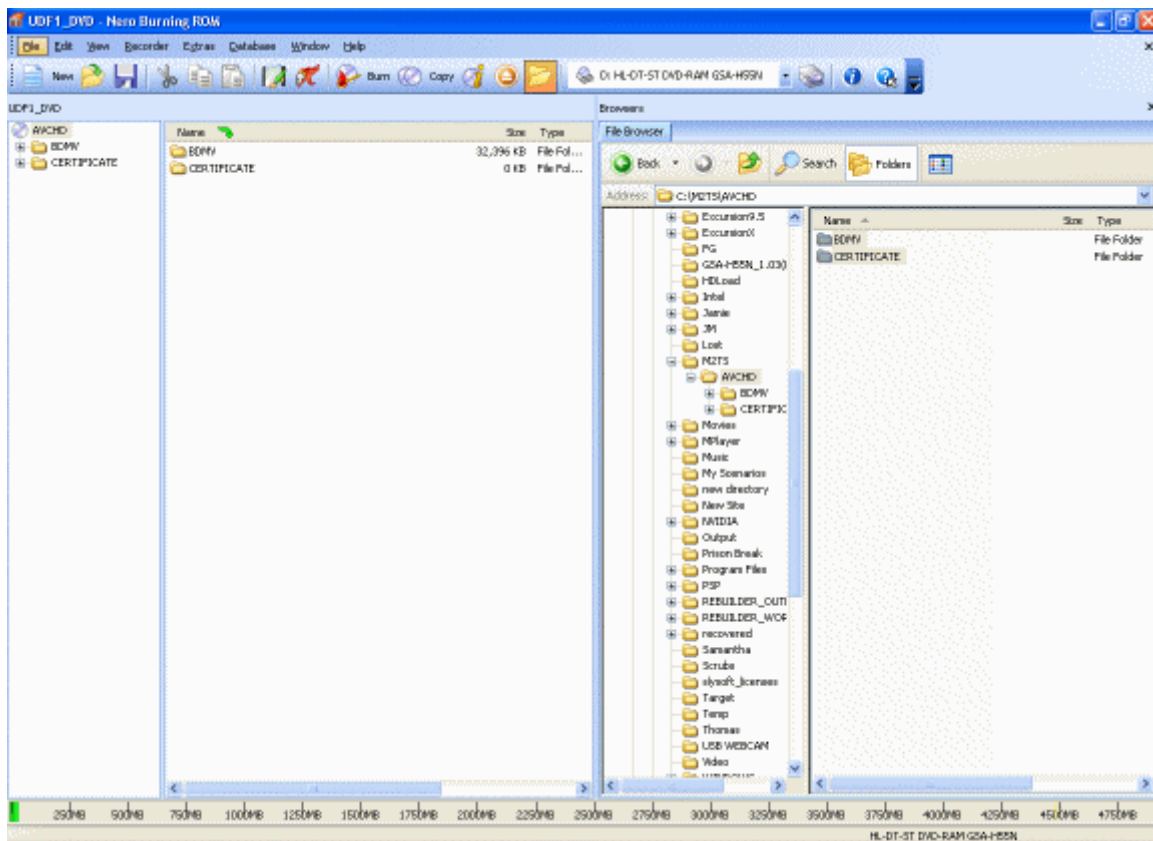
burning options (make sure DVD is selected, not CD). Scroll down the list on the left until you find the option for "DVD-ROM (UDF)". Select it as shown in the picture (click to enlarge).

### *Change to UDF 2.50 file system*



You must now set the file system to **UDF 2.50** or else the AVCHD disc won't be standard and probably won't work. Click the UDF tab as shown in the picture (click to enlarge). Under options, change to "Manual Settings (advanced users only)". Change UDF partition type to **Physical Partition** and change the **File-system version** setting to **UDF 2.50**. Once you have done that, click the big **New** button at the end of the program.

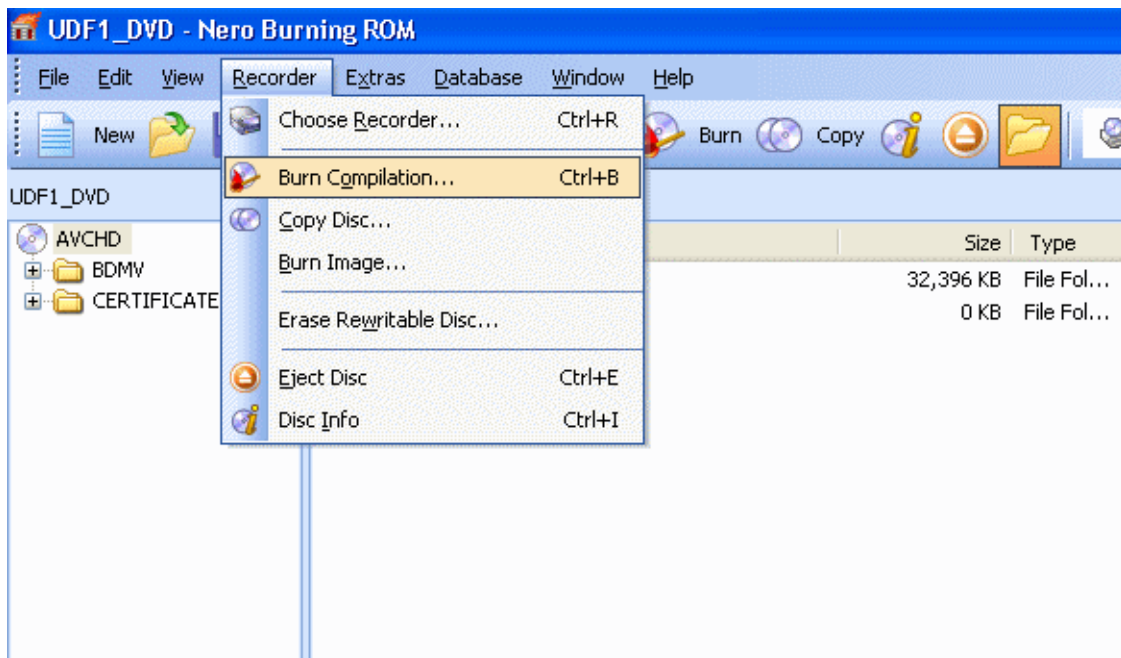
### *Edit compilation*



You now must add the BDMV folder from your template to your compilation once the program has loaded correctly (sometimes can take up to a minute). On the left is the compilation (what you want on the disc) and on the right is a file browser. Use the file browser on the right to locate the **BDMV** folder. Nero Vision has not created the in this example shown **CERTIFICATE** folder. There is no need for this folder.

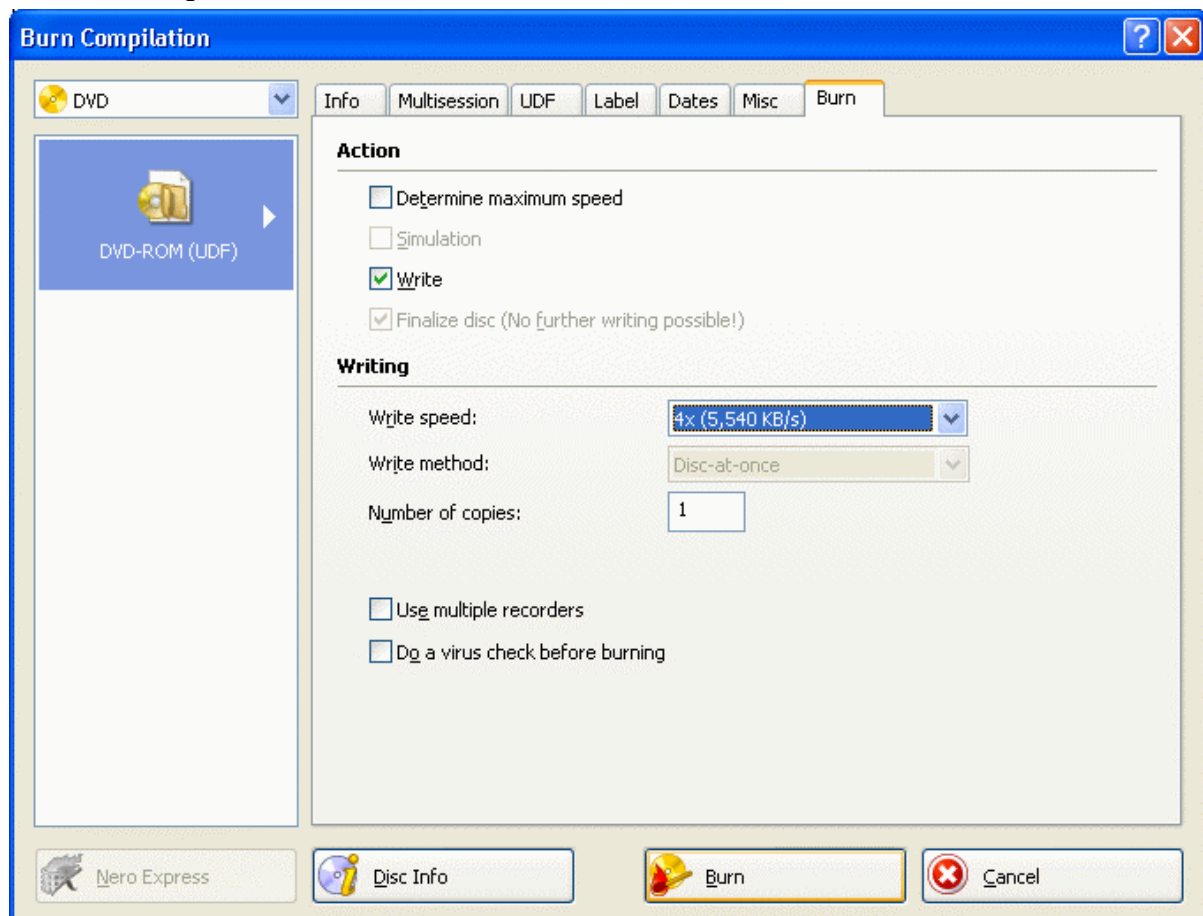
When you find the folder, you can either add it to the compilation list on the left by right-clicking and selecting that option, or you can simply click the folders and drag them across the program, then release them into the AVCHD compilation. Make sure the BDMV folder is at the root of the disc (it is not inside any other folder on the disc). Once you have added it, you are ready to burn.

### *Ready to Burn?*



Click the **Recorder** menu and click **Burn Compilation**, or hit **CTRL + B**.

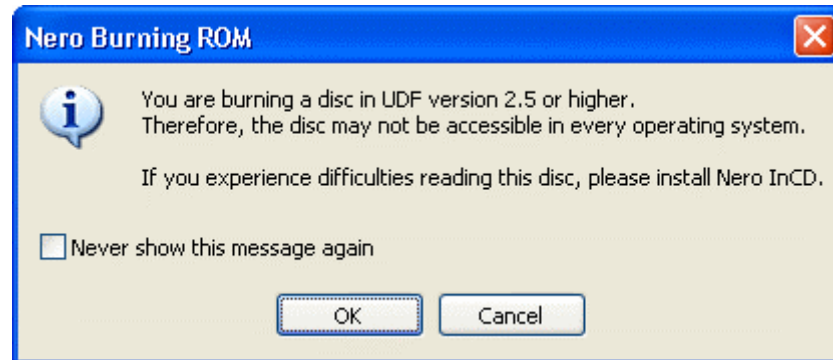
### *Select Write Speed*





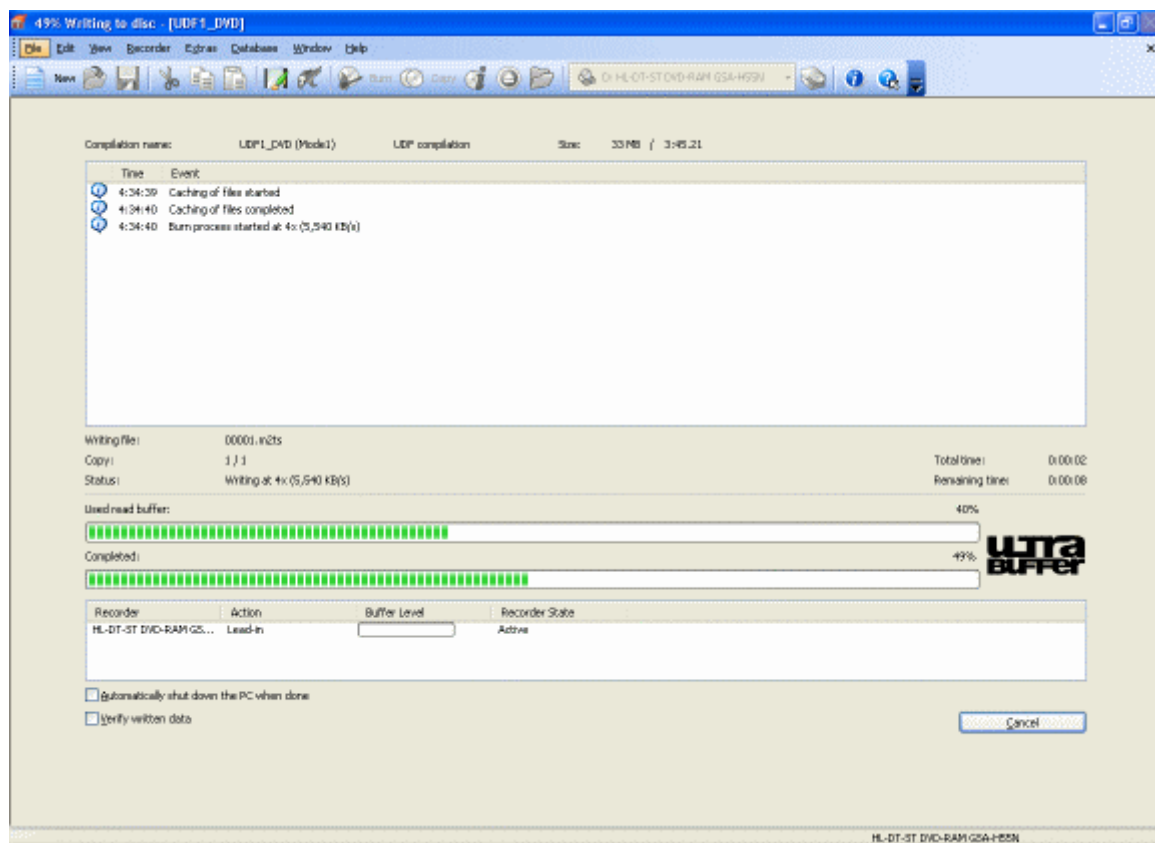
A new window will now pop-up that will give you a last chance to change any compilation settings you want, including the write speed. I recommend to use a lower speed than the maximum. Lower speeds (e.g. 4x) will result in a more reliable disc. Whenever you are ready now, click the large Burn button to begin the process... and you will immediately get a warning (in Nero 7).

### *UDF 2.50 Warning?*



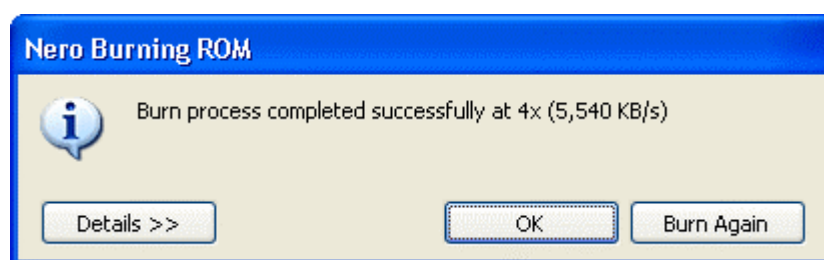
You will now get a warning informing you that the **UDF 2.50** file system may in fact cause you some compatibility problems. This may be true of a regular DVD-ROM compilation, but what we are creating here is AVCHD and it must be UDF 2.50. Click the **OK** button to begin the burning process (for real this time).

### *The Burning Process*



The amount of time the burning process will take depends entirely on the amount of data being burned and the speed of the burning process.

*Success?*



If the burning process was a success (which it should have been) you will now be prompted with a message telling you so. Now run along and try it out.



## Appendix 1 (Sonar alternative configurations)

### ASIO for All<sup>11</sup>

Enable the Yamaha AP-U70;

A4A buffer size: 512 samples;

Advance options:

- Latency compensation in and out: 32 samples;
- Deselect: Use hardware buffer;
- Deselect: Always resample;
- Deselect: Force WDM driver to 16 bit.

### Cakewalk Sonar 3 with ASIO driver

#### *Global options*

##### **General**

- Deselect: 'On Stop, Rewind to Now Marker'.

##### **Folders**

- Project files: E:\udata\cwp30;
- CAL files: E:\udata\cwp30.

##### **Audio data**

- Global Audio folder: D:\Geluid;
- Picture Folder: D:\Mijn Video's.

#### *Audio device configuration for Yamaha AP-U70*

##### **General**

- Audio Driver Bit Depth: not selectable (will be on 24);
- Sampling Rate: 44.100 Hz;
- File Bit Depth: 24;
- Buffers in play back queue: not selectable (will be on 2);
- Buffer Size at Fast.

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<sup>11</sup> If you are using the ASIO4ALL driver you must ensure that in the MIDI setup the 'MS GS Wavetable Synthesizer' is not selected.



## Advanced

- Deselect: Enable Read Caching;
- Deselect: Enable Write Caching;
- I/O buffer size: 128 kB;
- Driver Mode: ASIO<sup>12</sup>;
- Enable 'Share Drivers With Other Programs'.

## Drivers

Only the YAMAHA AP-U70 USB Audio driver will be visible, because it is the only with an ASIO driver.

## Driver Profiles

- Stream > 16 bit data as: 3 bytes.

## Cakewalk Sonar 6 (with ASIO4ALL driver)

### *Global options*

#### General

- Deselect: 'On Stop, Rewind to Now Marker'.

#### Folders

- Project files: E:\udata\cwp30;
- CAL files: E:\udata\cwp30\CAL.

#### Audio data

- Global Audio folder: D:\Geluid;
- Picture Folder: D:\Mijn Video's;
- Deselect: Use per-project Audio folder.

### *Audio device configuration for Yamaha AP-U70*

#### General

- Playback timing master: 'ASIO4ALL V2 USB-audioapparaat 1';
- Record timing master: 'ASIO4ALL V2 USB-audio-apparaat 1';
- Audio Driver Bit Depth: 24<sup>13</sup>;

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<sup>12</sup> If you do not want to use the ASIO4ALL driver, an alternative configuration is shown in Appendix 1 (Sonar alternative configurations)

<sup>13</sup> Will be set automatically.



- Sampling Rate: 44.100 Hz;
- Select: 64-bit Double precision Engine;
- Buffer size: at the lowest latency.

### **Advanced**

- Deselect: Enable Read Caching;
- Deselect: Enable Write Caching;
- I/O buffer size: 128 kB;
- Driver Mode: ASIO;
- Dithering: Triangle;
- Select 'Share Drivers With Other Programs'
- Select: ' Use Multiprocessing engine'
- Deselect: 'Play effect tails after stopping'.

### **Drivers**

- Select: the 'ASIO4ALL V2 USB-audio apparaat 1'.





## **Appendix 2 (Pinnacle Instant Write)**

With 'Pinnacle Instant CD/DVD' a CD or DVD can be burned. Pinnacle 'Instant CD/DVD' generates sometimes a glitch between two tracks.<sup>14</sup> The glitches can be avoided by unselecting the option 'Just Link' in the 'advanced mode', before burning the CD.

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<sup>14</sup> With the CD/DVD writer 'NEC 2500A'. It is not clear whether this is also true for other CD/DVD writers.